

What is claimed is:

1. Leak detectors for mixed heat exchangers comprising:
 - a first thermometer substantially exposed to a gas flow in a mixed heat exchanger, wherein said first thermometer measure a first temperature;
 - a second thermometer substantially isolated from said gas flow in said mixed heat exchanger, wherein said second thermometer measures a second temperature; and
 - a monitor for determining a difference between said first temperature and said second temperature;wherein said leak detectors registers a leak when said difference is greater than a predetermined threshold.
2. The leak detector of claim 1, wherein said second thermometer is substantially isolated from said gas flow by a barrier mounted in the gas flow portion of said mixed heat exchanger.
3. The leak detector of claim 2, wherein said barrier comprises a thermally conductive material.
4. The leak detector of claim 3, wherein said first thermometer is in thermal contact with said thermally conductive material.
5. The leak detector of claim 1, further comprising a third thermometer substantially exposed to said gas flow in said mixed heat exchanger, wherein said third thermometer measure a third temperature.
6. The leak detector of claim 1, wherein said monitor determines said difference between said first temperature and said second temperature over time.

7. The leak detector of claim 1, wherein said predetermined threshold is between 1.5-12 °C.
8. The leak detector of claim 7, wherein said predetermined threshold is 3 °C.
9. The leak detector of claim 1, wherein said monitor is remotely located in relation to said mixed heat exchanger.
10. A leak detector for mixed heat exchangers comprising:
 - a barrier mounted in a gas flow section of a mixed heat exchanger, wherein said barrier comprises thermally conductive material;
 - a first thermometer located inside of said barrier and in thermal contact with said thermally conductive material, wherein said first said first thermometer measure a first temperature;
 - a second thermometer located inside of said barrier and substantially isolated from said gas flow section, wherein said first said second thermometer measure a second temperature; and
 - a monitor that is remotely connected to said first thermometer and said second thermometer, wherein said monitor measure a difference between said first temperature and said second temperature;
 - wherein said leak detector registers a leak when said difference is greater than a predetermined threshold.
11. The leak detector of claim 11, wherein said monitor determines said difference between said first temperature and said second temperature over time.
12. The leak detector of claim 11, wherein said predetermined threshold is between 1.5-12 °C.

13. The leak detector of claim 11, wherein said monitor is remotely located in relation to said mixed heat exchanger.

14. The leak detector of claim 11, wherein said mixed heat exchange is shut down when said leak is registered.

15. A leak detection system for mixed heat exchangers comprising:
a plurality of barriers located in a gas flow section of a mixed heat exchanger;

wherein each of said barriers comprises an isolated thermometer and an exposed thermometer;

a first monitor that determines a difference in temperature between said isolated thermometer and said exposed thermometer for each of said plurality of barriers, wherein a set of differences are created;

wherein said leak detector registers a leak when said difference is greater than a predetermined threshold; and

a second monitor that compares said set of difference to approximate a location of said leak.

16. The leak detection system of claim 15, wherein said monitor and said second monitor are remotely located in relation to said mixed heat exchanger.

17. The leak detection system of claim 15, wherein said predetermined threshold is between 1.5-12 °C.

18. The leak detection system of claim 15, wherein said monitor determines said difference between said first temperature and said second temperature over time.

19. The leak detection system of claim 15, wherein said second monitor initiates a closure of said gas flow section in the region of said location of said leak.